

REMARKS

Status of the Claims

- Claims 1, 9-13, 20-22, and 25-29 are pending in the Application after entry of this amendment.
- Claims 1, 9-13, 20-22, and 25-29 are rejected by Examiner.

Claim Rejections Pursuant to 35 U.S.C. §103

Claims 1, 9-13, 21-22, 25-28 stand rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 6,016,151 to Lin in view of U.S. Patent No. 5,224,210 to Pinedo et al. (Pinedo) and in further view of U.S. Patent No. 7,116,339 to Wada . Applicant respectfully traverses the rejection.

Applicant notes that the present 35 USC §103(a) rejection is based on the combination of Lin, Pinedo, and Wada. As stated in MPEP §2143:

“To establish a *prima facie* case of obviousness, three basic criteria must be met.

First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant’s disclosure.” (MPEP §2143)

Considering the first requirement for a *prima facie* case, (i.e. suggestion of motivation to modify the references or combine the teachings), the MPEP at §2143.01 teaches that there are rational limitations to combining references in forming a *prima facie* case of obviousness. One such rational limitation is that the modification of a first reference by a second reference must not change the principle of operation of the first reference. If a second references does in fact change the principle of operation of the first reference, then there is no suggestion or motivation to combine the two references. This rational principle is stated in the MPEP §2143.01 Part V as follows:

**“THE PROPOSED MODIFICATION CANNOT CHANGE THE PRINCIPLE
OF OPERATION OF A REFERENCE**

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.” (MPEP §2143.01, Part V)

Stated simply, if the reference being modified (the first reference) has to change so much that the operative principle upon which the first reference is based is changed by the modification made by the addition of the second reference, then the combination is not permitted by the MPEP because the principle of the first reference is impermissibly changed and the result is that there is no motivation to combine the two references.

Applicant respectfully submits that this MPEP principle concerning lack of motivation to combine is present in the current rejection. The Applicant respectfully describes it below.

Lin teaches a “3D triangle rendering by texture hardware and color software using simultaneous triangle-walking and interpolation for parallel operation” (Title). Lin also teaches that that parallel operation of both the host processor and a graphics-accelerator are used to render a graphic. Lin at col. 6 lines 11-16 teaches:

“The inventor has realized that performance of 3D rendering can be improved if both the host processor and the graphics-accelerator hardware can operate on the same pixel at the same time. This parallel operation on a 3D pixel can lead to less expensive graphics-accelerator hardware for a desired 3D performance.” (col. 6 lines 1-16).

Lin gives examples of how the host processor and the graphics accelerator work simultaneously to render graphics. Lin teaches:

“FIG. 3 is a diagram of a personal computer (PC) with a 3D graphics-accelerator that operates in parallel on the same pixel with the host processor. Color and depth interpolation is performed for a pixel by the host processor while texture interpolation

for the same pixel is performed by the graphics-accelerator hardware.” (col. 6 lines 17-23).

“The slopes or gradients of the color components R,G, B, and texture and other effects components are first calculated by CPU 80 based on their values for the three vertices of the triangle. Rather than immediately calculate the x,y coordinates of each actual pixel within the triangle, CPU 80 sends the texture-component gradients to texture renderer 51 in graphics accelerator 40. One of the three vertices is also sent as a starting vertex for the triangle-walking.) (col. 6 lines 51-58).

Applicant notes that this joint and parallel processing by both the CPU and graphics accelerator in Lin is so important to the invention of Lin, that this parallel operation is expressed in the claims of Lin. Thus, Applicant concludes that Lin teaches a method whose principles are based in the shared or joint computation using the host processor and the graphics accelerator. This is the principle of operation of Lin. As a result, Lin also teaches away from the invention of pending Claim 1 which recites, in relevant part:

“A method for rendering graphics on a display device for a computer system having a central processing unit, system random access memory, and a graphics card, said graphics card comprising a graphical processing unit, video random access memory, and a frame buffer, said method comprising:

rendering a complex graphic in the system random access memory with the central processing unit...; and

copying said complex graphic from the system random access memory directly into the frame buffer by the central processing unit, wherein copying directly into the frame buffer *completely bypasses the graphical processing unit to render the complex graphic.* “ (Claim 1)

Since Claim 1 recites rendering a complex graphic by copying the complex graphic into RAM and *completely bypassing* the GPU in order to render the complex graphic, and Lin specifically teaches splitting the work of rendering a graphic between a graphics accelerator and a host processor, then Lin teaches away from Claim 1. Applicant submits that

independent pending Claims 13, 22, and 28 recite a similar complete bypassing of the GPU as does pending Claim 1.

Thus, whereas Lin depends on the principle of operation of sharing the work of rendering a graphic between both at CPU and a graphics processor, Claims 1, 13, 22, and 28 recite completely bypassing a GPU. Applicant respectfully submits that the operation of Lin, which is based on sharing the work between a host processor and at graphics accelerator actually teaches away from the pending claims which recites completely bypassing the graphical processing unit.

The Office Action dated 3/23/07, page 3 states:

“Thus, Lin fails to teach copying directly into the frame buffer bypasses the graphical processing unit. However, Pinedo et al teaches this feature.” (Office Action, page 3)

Applicant agrees that Lin does not teach that copying directly into the frame buffer bypasses the graphical processing unit. As argued above, the principle of operation of Lin is that graphics processing is shared between the CPU and the graphics accelerator. However, the addition of Pinedo actually changes the shared processing principle of operation of Lin.

Pinedo teaches, in Figure 1, an architecture that includes a host processor 20, a host interface 30, and a connection 90 from the host interface 30 to the frame buffer 70. Pinedo teaches:

“A pipeline bypass bus 90 is interfaced 30 to host processor 20 and frame buffer 70. Pipeline bypass bus 90 provides a separate path for data from host processor 20 to frame buffer 70. Thus, when data passes through pipeline bypass bus 90 to frame buffer 70, no overhead time through the graphics pipeline is incurred. Pipeline bypass bus 90 offers fast block transfer operations and direct frame buffer access for data output from host processor 20. (col. 8 lines 19-27).

Since Penido teaches rendering a graphic by bypassing the GPU and copying the complex graphic into the frame buffer, then Pinedo cannot be combined with Lin because the

restriction of completely bypassing the GPU in Pinedo violates the shared processing principle of operation upon which Lin is based.

As discussed above, the principle of operation of Lin involves sharing the work of rendering a graphic between the CPU and the graphics accelerator whereas the teaching of Pinedo bypasses the GPU to render a graphic. The addition of Pinedo to Lin impermissibly changes the principle of operation of Lin. Stated another way, the addition of Pinedo changes Lin from a shared or parallel processing implementation to a bypassed implementation where no joint or parallel processing between the CPU and the graphics accelerator are performed. The addition of Pinedo to Lin does not simply modify Lin, it fundamentally changes Lin. Also, as discussed previously, the basic shared processing principle of Lin teaches away from the claimed invention.

In addition, as noted above, MPEP §2143.01 Part V states that in an obviousness rejection, if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims prima facie obvious. (See MPEP §2143.01 Part V)

Applicant respectfully notes that Lin already teaches away from the claimed invention. Since the combination of Lin and Pinedo changes the principle of operation of Lin, and since Lin actually teaches away from the claimed invention, then, according to MPEP §2143.01 Part V, the combined teachings of Lin and Pinedo are not sufficient to render the claims prima facie obvious. The addition of Wada to the combination of Lin and Pinedo does not change the fact that Pinedo impermissibly changes the principle of operation of Lin.

Thus, Applicant respectfully requests withdrawal of the 35 USC §103 (a) rejection of the independent Claims 1, 13, 22, and 28 because the combination of Lin, Pinedo and Wada does not form a prima facie case of obviousness per the mandate of MPEP §2143.01 Part V. Thus, the pending claims patentably define over the cited art.

Claims 20 and 29 stand rejected under 35 U.S.C. §103(a) as unpatentable over U.S. Patent No. 6,016,151 to Lin in view of U.S. Patent No. 5,224,210 to Pinedo et al. and in further view of US Pat. No. 7,116,339 to Wada and in further view of US Pat No. 5,670,984 to Robertson et al. (Robertson). Applicant respectfully traverses the rejection.

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**PATENT
REPLY FILED UNDER EXPEDITED
PROCEDURE PURSUANT TO
37 CFR § 1.116**

Since Claims 20 and 29 are dependent upon amended independent Claims 13 and 28 respectively, and since independent Claims 13 and 28 patentably define over the cited art as stated above, then Claims 20 and 29 also patentably define over the cited art. Applicant notes that the addition of Robertson to the combination of Lin, Pinedo and Wada does not change the fact that the combination of Lin and Pinedo is impermissible under MPEP §2143.01 Part V. Applicant thus respectfully requests withdraw of the 35 USC §103 (a) rejection of Claims 20 and 29.

Conclusion

In view of the above amendments and remarks, Applicant submits that the present application is in a condition for allowance. Applicant respectfully and earnestly solicits a Notice of Allowance for all pending claims. Applicant respectfully requests that the MPEP 2143.01 Part V violation of the current 35 USC §103(a) rejection be fully addressed by the Examiner and if further questions arise, please contact the undersigned for a quick resolution so that a Notice of Allowance can be swiftly provided.

Respectfully submitted,

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